DOCUMENT RESUME

ED 437 008 HE 032 710

AUTHOR Bair, Carolyn Richert; Haworth, Jennifer Grant
TITLE Doctoral Student Attrition and Persistence: A Meta-Synthesis of Research. ASHE Annual Meeting Paper.
PUB DATE 1999-11-00
NOTE 48p.; Paper presented at the Annual Meeting of the Association for the Study of Higher Education (24th, San Antonio, TX, November 18-21, 1999).
PUB TYPE Information Analyses (070) -- Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Academic Persistence; Doctoral Degrees; Doctoral Dissertations; *Dropout Research; Graduate Students; *Graduate Study; Higher Education; *Meta Analysis; Qualitative Research; Research Methodology; Statistical Analysis; *Student Attrition; Student Motivation; Teacher Student Relationship; Time to Degree; Withdrawal (Education)
IDENTIFIERS *ASHE Annual Meeting

ABSTRACT

Forty to sixty percent of students who begin doctorates in selective colleges and universities do not persist to graduation. Although numerous research studies have focused on doctoral attrition and persistence, there have been no systematic studies because, among other reasons, there are no nationwide databases on attrition as there are for doctoral completion; also colleges and universities do not routinely and systematically collect data on attrition. This study synthesizes findings from the literature in an effort to develop a comprehensive understanding of doctoral student attrition and persistence. A new qualitative methodology-meta-synthesis was used to sort and integrate findings from the large body of research on doctoral student persistence. The sample for the study consists of 118 research studies completed between 1970 and 1998. Findings indicate that: (1) attrition and persistence rates vary widely depending on field of study, and even more widely depending on program of study; (2) departmental culture affects doctoral student persistence; (3) difficulties with the dissertation relate to attrition; (4) academic achievement indicators, with the exception of graduate record examination scores, are not effective predictors of degree completion; (5) employment and financial factors are poor indicators of persistence; and (6) retention rates vary widely among institutions. (Contains 168 references.) (RH)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 437 008

Doctoral Student Attrition and Persistence:

A Meta-Synthesis of Research

Carolyn Richert Bair
University of Northern Iowa

Jennifer Grant Haworth
Loyola University Chicago

Paper prepared for presentation at the
annual meeting of the Association for the Study of Higher Education (ASHE)
San Antonio, Texas
November 20, 1999

Please do not cite or reproduce without the permission of the authors

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY
V. Vaughn
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

BEST COPY AVAILABLE

HE 032 710

Abstract

In the United States, 40 to 60 per cent of students who begin doctorates in selective colleges and universities do not persist to graduation (Berelson, 1960; Bowen & Rudenstine, 1992). This strikingly-high dropout rate seems incongruous, given the tremendous importance of doctoral study to research, education, leadership, policy, and professional practice. Numerous research studies have focused on doctoral attrition and persistence in higher education; however, a systematic synthesis of such studies had not been completed. The purpose of this study was to conduct a meta-synthesis of the research on doctoral student attrition and persistence and to present findings and conclusions drawn from the synthesis. Meta-synthesis as a methodology was developed for this study.

ASHE *Association for the Study of Higher Education*

Headquartered at the University of Missouri-Columbia • College of Education • Department of Educational Leadership and Policy Analysis • 211 Hill Hall, Columbia, MO 65211 • 573-882-9645 • fax 573-884-5714

This paper was presented at the annual meeting of the Association for the Study of Higher Education held in San Antonio, Texas, November 18-21, 1999. This paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerned with higher education. It has therefore been selected to be included in the ERIC collection of ASHE conference papers.

Doctoral Student Attrition and Persistence:
A Meta-Synthesis of Research

Introduction

Forty to sixty percent of students who begin their doctoral studies in selective colleges and universities do not persist to graduation (Berelson, 1960; Bowen & Rudenstine, 1992; Nerad & Cerny, 1991; Tinto, 1987/1993). Despite careful selection processes employed by colleges and universities and despite the high achievement level of those pursuing the doctorate, attrition from doctoral programs has remained at this strikingly-high level for at least the past 50 years (Bowen & Rudenstine, 1992; Reiff, 1992).

This high dropout rate seems incongruous, given the tremendous importance of doctoral study to research, education, leadership, policy and professional practice. Recipients of doctoral degrees have traditionally occupied prestigious positions in research and education, where they have been called upon and funded to produce new knowledge. Doctoral education provides the labor force for top positions within the professoriate, educational administration, laboratories and research facilities, and it provides personnel for many positions within business and industry.

Because of the prestigious position occupied by doctoral education, it would seem to follow that students who do not complete their studies would be carefully and systematically tracked and understood and that an attrition rate of ostensibly 50 percent overall would be of tremendous concern to college and university administrators, faculty, and policy makers. However, this has not been the case. Many studies have been done that seek to understand aspects of attrition or reasons for persistence of students from one or more doctoral programs; however, very little research has been comprehensive in terms of the number of institutions included and the number of programs studied. Because of the many differences across studies, conclusions on doctoral student attrition and persistence have been difficult to draw.

There are many reasons why comprehensive research on doctoral-level attrition is lacking. One of the foremost reasons is that nationwide databases on attrition are not kept, as they are with doctoral completion (National Research Council, 1997). Likewise, colleges and universities often have no systematic, routine data collection processes established within programs, graduate

schools or records offices. Records on doctoral students are often housed at the program level or department level rather than centrally within the university. Accessing these records is seldom a smooth process; researchers have relied on the good will of each dean, department chair, program chair, or staff in order to complete archival work and follow up with students who have chosen to leave the institution. In some instances researchers have met with reluctance, because the dean or chairperson may not be well staffed to readily assist with the location of attrition and retention information or may have uncertainty concerning the results that will be produced. Students who have dropped out are often difficult to locate, and the information they provide comes from recollections, which may change over time. Moreover, tremendous variance exists among students and programs of study, and this has hampered research on doctoral student attrition and persistence. Due to these complexities, most attrition/retention researchers have restricted their studies to single institutions and sometimes to single programs, although a few studies that are more complex have been done with foundation or university backing (Bowen & Rudenstine, 1992; Nerad & Cerny, 1993).

Tinto (1987/1993) wrote that an important reason why there is less research on doctoral attrition than on undergraduate attrition is because "research on graduate attrition has not been guided either by a comprehensive model or theory of graduate persistence or by the methodological strategies that have been successfully employed in the study of undergraduate persistence" (p.231). Tinto maintained that such a model or theory would give shape to doctoral student persistence studies, as has been the case with research on undergraduate student persistence.

Purpose and Significance of This Study

The purpose of this research was to synthesize findings from the aforementioned literature in an effort to develop a comprehensive understanding of doctoral student attrition and persistence. Toward this end, a new qualitative methodology -- meta-synthesis -- was introduced to sort and integrate findings from the large body of research on doctoral student persistence. Through this method, themes were revealed from the accumulation of literature on doctoral student attrition and persistence.

Methodology

Approach to Inquiry

Researchers across the past 30 years have developed research syntheses as credible methodologies upon which to rely for the combination of multiple research studies on a similar topic. Two distinct types of research syntheses have been available prior to this study: meta-analysis and meta-ethnography. Glass (1976) formally introduced meta-analysis in the mid-1970s. In meta-analysis, the results of quantitative studies are statistically combined. Noblit and Hare (1988) developed meta-ethnography, which goes beyond a single case study, discourse analysis, narrative, or other ethnographic study in order to examine multiple accounts critically.

In this study, meta-synthesis is introduced as a means to synthesize findings from both qualitative and quantitative studies on the topic of attrition and persistence of doctoral students. Like other forms of qualitative research, meta-synthesis seeks to "describe and understand phenomena as wholes, or at least in ways that reflect their complexity" (Guba, 1978, p. 14). It is integrative and expansionistic, in that it compares and analyzes many studies together in a constructivist way, allowing interpretive themes to emerge from the synthesis.

The sample used for this study consists of research completed on doctoral student attrition and persistence between 1970 and 1998. Sources include published articles, books, dissertations, papers presented at national conferences, reports, theses, and unpublished studies. Various electronic databases were used to identify as many studies as possible of that time frame. Additionally, the ancestry approach of following bibliographies back to earlier research was used. Studies identified but not included in the sample were eliminated for one or more of five specific reasons: (a) the study was conducted prior to 1970, (b) the study did not produce clear and understandable findings, (c) the study did not separate "doctoral" students from "graduate" students, (d) the study attempted to understand persistence or attrition from the perspective of currently-enrolled doctoral students, and (e) a full copy of the study could not be obtained.

In light of these criteria, 430 research studies for possible inclusion in this meta-synthesis were identified; 118 were used as the final sample. The vast majority of studies excluded were

those written prior to 1970. Approximately one-tenth of the studies that were not used were excluded based on reasons 2, 3, 4, and 5 above.

Procedures

Both inductive and integrative approaches were used in the analysis of the data. A four-step process was followed:

1. Studies were gathered, read and summarized, and specific categories of information were noted on a summary form designed for that purpose. The summary form was carefully detailed to include the following categories of information: (a) Author(s), (b) Title of Study, (c) Source/Citation, (d) Date of Study, (e) Descriptions of the Study's Participants, (f) Institution(s) Represented, (g) Type of Study (design, methodology, analysis), (h) Instrument(s) Used (survey, interview protocol, institutional data), (i) Findings Regarding Rates of Attrition/Persistence, (j) What the Study Examined: Variables and Questions Studied, (k) Findings/Results Related to Persistence/Attrition, (l) Limitations of the Study, (m) Future Research Recommended, and (n) Also[1]. Because studies were systematically read and recorded in this way, pertinent information was then available in summary form for use in the integration and synthesis of studies. Additionally, during this first step, quotations were recorded on the reverse side of the summary form so that they were readily available and could be used later to illuminate, explain, or interpret the findings.

2. Determinations were then made of how the studies were related, recording information category by category. A second summary sheet, a matrix of information, was used for this purpose (Miles & Huberman, 1984/1994). The matrix was designed to lift information that related to each specific category of findings (such as financial assistance and its relationship to attrition/persistence) from each summary form described above and then, in turn, to record this information on the matrix. This process produced matrices which, in effect, functioned as written summaries of key findings across studies, topic by topic, and which contained the weight of the evidence for each item of study. The categories of information recorded from each study

---

[1] the category "also" was used to make notes regarding interesting or important information which did not nicely fit into one of the column headings.

generally included: (a) Author, (b) Date, (c) Institutions Studied, (d) Fields of Study, (e) Type of Research Study; (f) Methodology Used, and (g) Findings.

3. The next step was to "translate" the studies into one another using the matrices, a procedure which allowed for comparisons of each category of information across studies. Results of studies were juxtaposed, cross compared, and integrated. Color coding was used to highlight the different categories of entries on each matrix of information. The following types of questions were asked: Were there similarities, commonalities, or contradictions across studies with regard to each category of information? What could been seen about any category of findings in one study and how did that relate to other studies in the sample?

4. Finally, the translations noted above were synthesized, and findings were compared in order to see the many categories of information in relationship to each other. Themes were looked at in terms of other themes. Cross comparisons focused on multiple programs, fields of study, and colleges/universities In this last analytical step, the focus was on the whole, or all of the themes of the study, and on understanding them in context.

Validity

Trustworthiness within this study was established through confirmability, credibility, and transferability (Lincoln & Guba, 1985). Confirmability in this meta-synthesis was established through the large number of studies included. All available studies that met the criteria for inclusion in the meta-synthesis were used, and the research findings were carefully read and recorded on summary sheets and matrices. To ensure credibility of the findings, an external review process was used, in which an external auditor (a colleague) examined three studies from the research sample and the corresponding summary forms and matrices. There was essential agreement between the external auditor and researcher on the information being recorded from the research studies to the summaries. Transferability was present in the structure of a meta-synthesis, in that multiple accounts over time were examined.

Limitations

The most obvious limitation of a meta-synthesis of existing research is that the data are limited to those research studies selected for inclusion. Accordingly, factors associated with

doctoral students' decisions to persist or to drop out may have yet to be identified. A second limitation relates to the quality of the initial research, in that quality of research was not used to exclude studies other than those that did not contain clear and understandable findings. Mullen and Rosenthal (1985) described a further limitation: the "file drawer" problem (p. 17). Rosenthal (1984) estimated that only 5 per cent of studies (those with significant results) are published. The remaining 95 percent are relegated to storage in a file because results were not significant. This, of course, would skew the body of research coming forward to the meta-researcher. To be certain, this phenomenon may be much less likely to occur in research studies that are qualitative, in that statistical significance is not a defining characteristic of qualitative research and qualitative researchers report their findings without having comparison as a requisite feature.

Findings and Discussion

This section outlines the key findings from the 118 research studies on doctoral student attrition and persistence reviewed for this meta-synthesis. It is organized using topical headings, each of which summarizes an area of key findings.

The research studies used varied widely. Approximately two-thirds of the institutions at which the studies were conducted are classified as Research I universities; the remaining one-third are state universities, private colleges and universities, and professional schools. Many of the studies reviewed were conducted at single institutions; far fewer studies involved two or more institutions. Some of the studies concentrated on all doctoral programs within a graduate school, while others focused on several programs in a single school or department or even a single program.

Attrition and Persistence Rates Vary by Field of Study

Doctoral student attrition and persistence rates vary widely depending on the field of study and even more widely depending on program of study. The lowest attrition rates were found in the laboratory sciences, and the highest rates occurred in the social sciences and humanities.

"When academic and demographic factors were controlled, the factor that was repeatedly significant in predicting degree completion was a student's field of study ... each field of study acts as a separate environment within the institution and has a differential impact on rates of

degree completion" (Benkin, 1984, pp. 155, 165). The weight of the research evidence suggests strongly that doctoral student attrition and persistence rates differ by field of study and even more by program of study (Bauer, 1997; Benkin, 1984; Berg & Ferber, 1983; Bowen & Rudenstine, 1992; Decker, 1972, 1973; Ferrer de Valero, 1996; Golde, 1995, 1996; Jacks, Chubin, Porter, & Connolly, 1983; Matchett, 1988; Nerad & Cerny, 1991; O'Connell, 1991; Ott, Markewich & Ochsner, 1984; Reamer, 1990; Sauer, 1986; Swoboda, 1978; Valentine, 1986, 1987; Zwick, 1991). Generally speaking, the lowest rates of attrition have been found in the laboratory sciences and the highest rates in the social sciences and humanities. For example, Golde (1996) documented the following attrition rates in a large Research I university: 17% for life sciences, 21% for physical sciences, 27% for humanities, and 27% for social sciences. When she disaggregated the data at the departmental level, she found further variations: 18% attrition for biology, 27% for geology, 30% for English, and 37% for history (1984-89 cohorts). Without disaggregating the data at all, Golde would have simply found an overall attrition rate of 23%, with 14% still enrolled and 62% graduated. Her analysis of the data by field of study revealed that attrition rates vary depending on field and program of study. Similarly, Nerad & Cerny (1991) found completion rates ranging from 72% for biology to 37% for languages and literature at the University of California, Berkeley, for 1978 and 1979 cohort groups (see Table 1).

Explanations for these differences by field of study have been offered by numerous researchers. For example, Sauer (1986) suggested that lower attrition rates in the sciences may be related to the "exacting structure imposed on [science] students by the laboratory sciences and by financial support of their students," whereas higher attrition rates in the social sciences may be "due in part to less structure, more ambiguous expectations, and less financial support" (p. 3). "In many of the physical and life science disciplines," wrote Sauer, "research is conducted in a laboratory by groups of Ph.D. candidates and fellows under the direct supervision of their advisor" (p. 167). There is a greater involvement between the advisor and the advisee as the dissertation topic is chosen and also a "greater likelihood that the advisee's dissertation research was a part of the advisor's research project in the physical and life sciences than in the humanities or social sciences" (p. 167). Because of the team atmosphere present in the lab, characterized by

constant contact between student and advisor, there is "day-to-day awareness of expectations for progress and observation of whatever progress is being made" (p. 167). Sauer contrasted this with those typically found in the humanities and social sciences, where "research ... is done in solitude, and often in the field. Ph. D. candidates are less in contact with their advisors and Ph. D. counterparts, less supervised, and there is less day-to-day awareness of the passage of time and attainment of project timelines or milestones" (p. 167).

TABLE 1. Completion Rates by Field of Study

Author	Completion Rates	Time Frame	University
Bowen & Rudenstine	65% Natural Sciences 55% Economics, Political Science 50% English, History, Other Humanities	1967-76, studied in 1992	Ten Research I 1992 Universities
Ferrer de Valero	3% Adult & Continuing Ed. 80% Accounting	1986-90, studied in 1996	Research I 1996
Nerad & Cerny 1991	72% Biology 69% Physical Science 65% Natural Resources 49% Social Science 48% Professional 39% Arts 37% Language/Literature	1978-79, studied in 1989	Research I
O'Connell	63.11% Medical Sciences 23.81% Humanities	1976-81, studied in 1989	Doctoral I

Variations in the financial assistance made available to doctoral students by field also appear to play a role (Berg & Ferber, 1983; Bowen & Rudenstine, 1992; Ferrer de Valero, 1996; Sauer, 1986). For example, Berg and Ferber (1983) found that 9 out of 10 doctoral students in the physical and biological sciences received assistantships or fellowships, compared to only 30% of women and 56% of men in education. For the same grouping from 32 departments at a Research I university, 68% of men and 46% of women earned Ph. D.s in the sciences, compared to 22% of men and 28% of women in education.

Researchers using qualitative methodologies have likewise contributed to the discourse on differences in attrition and completion rates by field of study (Ferrer de Valero, 1996; Golde, 1995, 1996; Jacks, Chubin, Porter & Connolly, 1983). As more qualitative studies are completed, descriptions of how students in various fields experience doctoral education differently will be provided.

There appears to be a solid connection between completion rates when analyzed by field of study and the length of time that it takes to earn the degree -- the longer doctoral students spend in the process of earning the doctorate, the lower the likelihood that they will complete those degrees (Bowen & Rudenstine, 1992; Ferrer de Valero, 1996; Nerad & Cerny, 1991; Sauer, 1986). In Bowen and Rudenstine's (1992) study, completion rates and time to degree (TTD) varied "more systematically with field of study than any other variable" (p. 123). Bowen and Rudenstine further found that "natural science always has the highest completion rate, followed by social science, and then humanities, across data sets, across gender, across time, across funding" (1992, p. 124).

Departmental Culture Affects Doctoral Student Persistence

Doctoral degree completion is related to interactions students have in the colleges and universities of which they become a part. In this section, we highlight student/faculty relationships, student involvement in academic life, student satisfaction with program, student-to-student interactions, institutional financial assistance to students, and dissertation factors.

The degree and quality of the relationship between doctoral student and advisor or faculty has a strong, positive relationship to successful completion of the doctorate. The single most frequently-occurring finding in this meta-synthesis was that successful degree completion is related to the degree and quality of contact between a doctoral student and her or his advisor(s) or other faculty in the student's doctoral program. Simply put, where positive relationships between students and their advisors or other faculty members were present, students were significantly more likely to complete their doctoral degrees than students for whom such positive relationships did not exist. This finding held true across quantitative, qualitative, and mixed-methodology studies.

In the vast majority of studies, degree recipients were distinguished from those who had either withdrawn or were all but dissertation (ABD), and the value of a positive student/advisor or student/faculty relationship was one of the cited variables (Benkin, 1984; Berg & Ferber,1883; Butler, 1995; Campbell, 1992; Carlson, 1995; Clewell, 1987; Cooper, 1996; Daniels-Nelson, 1983; Delaney, 1981; Dickinson, 1983; Dolph, 1983; Ducette, 1990; Ferrer de Valero, 1996; Flores, 1984; Foote, 1988; Gell, 1995; Girves & Wemmerus, 1988; Golde, 1994, 1996; Grissom, 1985; Hagedorn, 1993; Hassan-Shahriari, 1983; Howard, 1981; Huang, 1995; Huguley, 1988; Jacks, Chubin, Porter & Connolly, 1983; Jones, 1987; Karolyi, 1993; Lawson, 1985; Leadabrand, 1985; Lees, 1996; Lenz, 1994; Long, 1987; Lovitts, 1996; Macht, 1978; Mah, 1986; McCabe-Martinez, 1996; Muszynski, 1988; Nagi, 1974; Nerad & Cerney, 1991; O'Bara, 1993; O'Connell, 1991; Patterson-Stewart, 1996; Presley, 1996; Reamer, 1990; Reiff, 1992; Sauer, 1986; Schultz, 1983; Skudlarek, 1992; Swoboda, 1978; Tierce, 1984; Valentine, 1986, 1987; Wagner, 1986). In studies of attrition, the student's departure was found to be due in part to inadequate or inaccurate advising, lack of interest or attention on the part of the advisor, unavailability of the advisor/faculty to students, or a negative relationship or even conflict between the student and advisor/faculty (Campbell, 1992; Delaney, 1981; Dickinson, 1983; Dolph, 1983; Golde, 1994; Heiss, 1970; Huguley, 1988; Jacks, Chubin, Porter,& Connolly, 1983; Karolyi, 1993; Lovitts, 1996; Mah, 1986; Muszynski, 1988; Nerad & Cerney, 1991; Porozny, 1970; Reiff, 1992; Swoboda, 1978). Descriptors of the faculty/student relationship were provided by researchers, both as they relate to successful degree completion and to attrition. Table 2 contains representative descriptors excerpted from the studies of successful degree completion, clustered into three general categories. Table 3 contains those items seen as contributing to non-persistence. Some researchers have identified the student/advisor relationship as an important, if not the most important, variable in doctoral student attrition and persistence (Dickinson, 1983; Ferrer de Valero, 1996; Girves and Wemmerus, 1988; Nagi, 1974; Presley, 1996).

TABLE 2. Descriptors of Student/Advisor and Student/Faculty Relationships that are Positively Related to Successful Degree Completion

Quality of the relationship	Characteristics of the advisor
Positive relationships in quality and time	Easy to approach
Ability to talk about problems encountered	Accessible (faculty and chairperson)
Close, personal relationship	Personally supportive of students
Satisfactory interaction	Cooperative
Good student/advisor relationship	Concerned for students as persons
Value of student/faculty interaction	Supportive (major professor)
Student is satisfied with relationships	Supportive (committee members)
Student is treated as junior colleague	Supportive (general faculty)
Student knows one or more faculty quite well	Encourages students
Frequent contacts	Encourages student/faculty interaction
Ease of interaction	Personally supportive of students
Opportunities to meet informally	Caring, patient, kind
Characterized by trust	High amount of help
	Concern for student development
High level of faculty/advisor expertise	Supportive mentor
	Voice of care and power
High quality of advising	Concern for teaching
Quality as a teacher and scholar	Acceptance of students
Usefulness in providing needed information	Confirmation of students
Caring as an advisor	Personal counseling of students
National reputation as faculty	Friendship with students
Helpfulness on questions related to research	
Academic coaching	
Career sponsorship	
Provides valuable advice	

Student involvement in various programmatic, departmental, institutional, and professional activities and opportunities contributes favorably to doctoral student retention and completion. Research evidence also suggests that student involvement is related to doctoral student retention and completion (Benkin, 1984; Boozer, 1972; Brien, 1992; Ducette, 1990; Ferrer de Valero, 1996; Girves & Wemmerus, 1988; Golde, 1995, 1996; Lawson, 1985; Nerad and Cerny, 1991; Reamer, 1990; Reiff, 1992; Skudlarek, 1992; Valentine, 1986, 1987). Involvement includes attendance at and participation in graduate association meetings, academic activities, social activities, informal and formal meetings, and activities of the profession. With only two exceptions (Dolph, 1983; Frasier, 1993), researchers who included interpersonal involvement and participation in academic life found them to be significant variables.

TABLE 3. Characteristics of Student/Advisor and Student/Faculty Relationships that are Related to Attrition in Research Studies

Concerns with program/department/school	Concerns with dissertation advisor/advisement
Community not nurturing	Problems with dissertation advisor
Need to understand department structure	Problems with dissertation committee
Need to know who is in authority	Lack of advisor cooperation
Need clarity on where to go with problems	Lack of advisor understanding
Need for useful information	Advisor not caring
Insufficient guidelines/suggestions	Dissertation advisor not helpful
Lack of clarity on criteria for evaluation	Dissertation advisor not encouraging
Extremely informal rules in the department	Mismatched expectations and working styles
Need career sponsorship	Number of advisor's current committees
	Insufficient support by major professor
Concerns regarding faculty	Inadequate advising during dissertation
	Difficulty finding a director
Problems in faculty/student relationships	Major faculty changes during dissertation
Student not well acquainted with faculty	Advisor left the institution or died
Need faculty to serve as supportive mentors	More attention needed from director
Insufficient active intervention by faculty	Need guidance from major professor
Need to interact informally with faculty	Need better advice from chairperson
Ambiguity regarding faculty expectations	Infrequency of contacts
Lack of encouragement from faculty	Student's standing with advisor unknown
Need more faculty concern for teaching	Support for stress during dissertation
Hesitant to approach faculty	Inaccessibility of advisor
Need faculty concern for student development	
Need faculty voices of care and power	

The need for universities to have intentional structures that support the academic and social integration of doctoral students is an outcome of Golde's (1995; 1996) studies. Based on her mixed-method examination of departmental contextual factors at a major research university, Golde (1996) concluded that "departmental context is a central contributor to attrition" (p. 356-357) and identified numerous areas for examination of departmental practices and other potential contributors to attrition, including "office locations, student directories, orientation programs, student participation in departmental decision making, [and] doctoral studies requirements" (p. 358). The timing and communication of departmental rules, regulations, structures, and processes were also found to be important (Golde, 1996; Lawson, 1985).

The importance of participation in professional activities for successful degree completion has been established (Clewell, 1987; DeStigter, 1983; Ducette, 1990; Harris, 1976). For example, in her path analytic test of Tinto's model within a single institution, Ducette concluded that "it is

the individual's level of integration into both the academic and social systems that most directly affects graduation" (p. 121).

Students' satisfaction with their academic programs -- including the perceived fulfillment of their doctoral expectations -- contributes favorably to doctoral degree completion. Research evidence underscores that students' satisfaction with their academic programs -- including the perceived fulfillment of their doctoral expectations -- contributes favorably to doctoral degree completion (Boozer, 1972; Cooke, Sims & Peyrefitte, 1995; Foote, 1988; Girves & Wemmerus, 1988; Golde, 1995, 1996; Lovitts, 1996; Murrell, 1987; Nagi, 1974; Sauer, 1986; Skudlarek, 1992; Valentine, 1986, 1987). The converse also holds sway: when students are disappointed in or dissatisfied with their doctoral programs, they are far more likely to abandon doctoral study (Boozer, 1972; Lovitts, 1996).

What contributes to students' satisfaction with their doctoral programs? Based on the research studies reviewed, the following items were most consistently mentioned: quality of the program, communication with students, fairness in requirements, consistency in the evaluation of students, concern for students as professionals, and guidance. Those doctoral students who were most likely to complete were those who were satisfied with their programs, courses, and instruction (Ducette, 1990; Foote, 1988); those who perceived the course work to be of high quality and value (Valentine, 1986, 1987); those who had higher levels of satisfaction and whose expectations had been met (Cooke, Sims, & Peyrefitte, 1995); and those who were not only satisfied with their programs of study, but also with the work that they had completed in those programs (Skudlarek, 1992).

Peer interaction is related to persistence, insofar as degree completers are more likely to be involved with their academic peers than non-persisters. Student-to-student relationships and social integration figure into student attrition or persistence as well, although not as prominently as student/faculty relationships and student involvement in academic life (Lovitts, 1996). The interest in and support of doctoral students for each other was found to be an important factor in all but two of the research studies in which it was examined (Dolph, 1983; Frasier, 1993).

In the quantitative studies reviewed, degree completers were more likely to be involved with their academic peers than non-persisters (Benkin, 1984; Boozer, 1972; Brien, 1992; Dolph, 1983; Ferrer de Valero, 1996; Grissom, 1985; Hagedorn, 1993; Leadabrand, 1985; Tierce, 1984). Similarly, this finding held sway in qualitative and mixed-design studies (Brien, 1992; Ferrer de Valero, 1996).

The financial support offered to doctoral students by colleges and universities is related to attrition and persistence; students who hold research assistantships, teaching assistantships, fellowships, or graduate assistantships are more likely to complete their degrees than students who rely on other types of funding. One of the "structures" universities have in place to attract and support doctoral students is financial assistance. Yet, does financial support relate to doctoral student persistence? The weight of the evidence suggests that it does, and that different types of financial support relate to correspondingly different levels of persistence (Benkin, 1984; Boozer, 1972; Bowen & Rudenstine, 1992; Cook & Swanson, 1978; Dolph, 1983; Ducette, 1990; Franklin, 1970; Girves & Wemmerus, 1988; Macht, 1978; Sauer, 1986). This is a finding that cannot be considered without reference to field of study, insofar as the funding types differ and are much higher in certain fields of study (Bowen & Rudenstine, 1992; Sauer, 1986). For example, it is normative for students in the sciences to be fully supported, whereas humanities and social sciences students may receive only partial support and may work away from campus (Benkin, 1984).

That said, there are a number of general findings regarding the relationship between financial support and persistence that are evident in the research literature:

- Students who hold teaching assistantships have higher rates of completion than many other categories of doctoral students (Bowen & Rudenstine, 1992; Boozer, 1982; Dolph, 1983; Franklin, 1970; Huang, 1995; Macht, 1978).
- Students who hold research assistantships have higher rates of degree completion than many other categories of doctoral students (Benkin, 1984; Boozer, 1972; Bowen & Rudenstine, 1992; Dolph, 1983; Huang, 1995; Sauer, 1986).

- Fellowship students have high completion rates (Benkin, 1984; Boozer, 1972; Dolph, 1983; Franklin, 1970; Huang, 1995; Macht, 1978).
- Having a graduate assistantship was a strong, positive indicator of graduation (Cook & Swanson, 1978; Dolph, 1983; Ducette, 1990; Franklin, 1970) for students in educational administration.

In her study of attrition across all doctoral fields at a major research university, Benkin (1984) concluded:

> It seems clear that students who have the types of support that either require no work (fellowships and grants) or that reward students for doing the type of research that leads to a degree (research assistantship) will be more likely to progress rapidly toward a degree. In contrast, students who have to work at positions not directly related to their research, whether on or off campus, will be more likely to progress more slowly or not at all. (p. 159)

Bowen and Rudenstine (1992) studied minimum completion rates to determine whether the financial support for the students came from "institutional" or from "own support" sources (p. 179). They found that minimum completion rates for one of the institutions were as low as 14.2% for those students relying on their own support to 41.8% for students receiving institutional support (p. 179). In another institution in the same study, students relying on their own support had a 37.9% completion rate, compared to a 63.0% completion rate for those receiving institutional funding. All five of the examples of institutional versus own support provided by Bowen and Rudenstine (1992) show the same directionality, leading to the conclusion that "students forced to rely primarily on their own resources have had markedly higher attrition rates and longer TTD than comparable students who received financial aid" (p. 178)[2].

---

[2]Bowen and Rudenstine (1992) indicated that stage of attrition may be an important factor to consider when examining funding patterns and student retention. Citing an example at The University of Chicago, they noted that "attrition rates for own support students were high in the pre-ABD years, but relatively low for those who cleared that hurdle" (p. 182).

Difficulty with various aspects of the dissertation relates to attrition. The dissertation phase of doctoral study has been the direct focus of some research studies; in others, it has been included as an important aspect (Bauer, 1997; Cooper, 1996; Daniels-Nelson, 1983; Delaney, 1981; Franek, 1982; Gell, 1995; Grissom, 1985; Hassan-Shahriari, 1983; Hobish, 1978; Howard, 1981; Huguley, 1988; Jacks, Chubin, Porter & Connolly, 1983; Jones, 1987; Karolyi, 1993; Lees, 1996; Lenz, 1994; Mah, 1986; Mariano, 1993; McCabe-Martinez, 1996; Muszynski, 1988; Peacock, 1996; Testa, 1985; Tierce, 1984; Valentine, 1986, 1987; Wagner, 1986). Not surprisingly, less difficulty with many aspects of the dissertation has been found to relate to doctoral degree completion (Valentine, 1986, 1987). Muszynski (1988) listed seven factors that aided in dissertation completion based on her multiple regression analysis study of psychology doctoral students and graduates at a major university: (a) good advisor (supportive, interested, competent, secure), (b) good topic choice (accessible, manageable, interesting), (c) internal strength (independence, high motivation, ability to endure frustration), (d) self-imposed deadline or goal, (e) avoiding or limiting employment, (f) delaying internship (until completion of dissertation), and (g) externally-imposed incentives (such as future employment). (p. 81) Conversely, Muszynski (1988) found that personality factors such as perfectionism and depression, as well as stressful life events, may hinder dissertation completion.

Three particular aspects of the dissertation phase were studied by multiple researchers. These were selection of topic, time devoted to the dissertation, and change in academic format.

Researchers have concurred that early selection of the dissertation topic was important for successful degree completion (Delaney, 1981; Grissom, 1985; Mah, 1986; McCabe-Martinez, 1996). Some factors related to attrition in the dissertation phase of study were the number of times the dissertation topic changed (Delaney, 1981), difficulty reducing the topic and making it manageable in scope (Hugeley, 1988), lack of an appropriate, strong dissertation topic (Lenz, 1994), and a poor topic choice or inaccessible subject (Muszynski, 1988). Conversely, variables related to successful degree completion included little difficulty with the selection of a topic (Howard, 1981), selection of a stimulating, strong, and exciting dissertation topic (Lenz, 1994), and selection of an interesting and manageable topic (Muszynski, 1988).

Maximizing the time devoted to the development of the dissertation aids in completion (Delaney, 1981; Wagner, 1986). Not surprisingly, spending time with the demands of one's job rather than on the dissertation was found to stand in the way of dissertation completion (Hugeley, 1988).

Mah (1986) described the changes that take place as a doctoral student moves from course work and examination into the dissertation phase as a "cut-off from the previous structure of scheduled classes, from deadlines, and from opportunities for interaction with students and faculty" (p. 132). These changes, Mah found, hindered degree completion. The lack of structure in the dissertation stage was reported to be an obstacle to completion by 50% of ABDs in Hugeley's (1988) study.

Academic Achievement Indicators Have not Been Found to be Effective Predictors of Doctoral Degree Completion, With the Exception of GRE Advanced Scores

Many research studies have been done in an effort to understand what types of individuals make the most "successful" doctoral students. The predictive studies of the 1970s, continuing to a lesser degree into the 1980s and 1990s, were often institutional research studies in which the focus was on differences between those who persisted and those who did not, largely through analysis of institutional records. Numerous independent variables have been examined, including Graduate Record Examination (GRE) scores, Miller Analogies Test (MAT) scores, grade point averages (GPA), and academic majors.

Studies that have examined the relationship between GRE scores and doctoral student degree completion contradict each other considerably, with the exception of GRE Advanced scores. GRE Verbal scores were found to predict doctoral degree completion in only 3 out of 20 studies (Harris, 1976; Howard, 1981; Porozny, 1970); in the remaining 17 studies statistically significant relationships were not found. Along these same lines, only 11 studies out of 26 reported GRE Quantitative scores to be predictors of completion (Burnham & Hewitt, 1972; Hackman, Wiggins, & Bass, 1970; Harris, 1976; Howard, 1981; Lemp, 1980; Mann, 1977; Nagi, 1974; Porozny, 1970; Traw, 1973; Williams, Harlow, & Gab, 1970; Willingham, 1974). GRE

Advanced test scores were shown to relate to successful degree completion in four out of six studies (Hirschberg & Itkin, 1978; Porozny, 1970; Traw, 1973; Williams, Harlow & Gab, 1970).

Miller Analogies Test (MAT) scores were not consistent predictors of successful degree completion. In twelve studies that examined the MAT as a correlate of persistence, statistical significance was found in only four (Harris, 1976; Hochberg, 1972; Krauskopf, 1973; Porozny, 1970).

Undergraduate GPA was found to be related to doctoral student persistence in only 5 out of 23 studies (Bybee, 1972; Franklin, 1970; Harris, 1976; Hochberg, 1972; Porozny, 1970). Five of fifteen researchers found master's GPA to relate positively to doctoral degree completion (Harris, 1976; Huang, 1995; Porozny, 1970; Williams, Harlow & Gab, 1970). Doctoral GPA has been studied as well; of 12 studies reviewed, only three identified doctoral GPA as a significant predictor of completion (Cook & Swanson, 1978; Pristo, 1977; Traw, 1973).

In addition to the aforementioned variables, several other academic indicators have been studied, if only by a few scholars. The results of these studies suggest that none of the following variables are adequate predictors of doctoral completion: baccalaureate origins (i.e., type of undergraduate institution, quality of undergraduate institution) (Boozer, 1972; Decker, 1972, 1973; Franklin, 1970; Pristo, 1977); holding the master's prior to admission to the Ph.D. (Decker, 1972, 1973; Grissom, 1985; Pristo, 1977); length of time between bachelor's degree and master's degree (DeStigter, 1983; Muhic, 1971), time elapsed between master's degree and doctorate (Franklin, 1970; Pristo, 1977); length of time between bachelor's degree and doctorate (Dolph, 1983; Pristo, 1977); master's degree major (Franklin, 1970; Schultz, 1983); prior undergraduate major (Schultz, 1983); number of years taken to complete the master's degree (Muhic, 1971); and junior/senior GPA for the last two years (Lunneborg & Lunneborg, 1973).

The weight of the research evidence suggests rather convincingly that traditional academic indicators are not reliable predictors of persistence to the doctoral degree. This led Dolph (1983) to conclude that "future studies on attrition should concentrate on more intrinsic and substantive matters and move away from investigations of demographic variables" (Dolph, 1983, p. 97).

Findings are Mixed With Respect to Employment and Financial Factors

While many students are funded by their universities or other sources, others continue to work full- or part-time during their doctoral programs. Across several studies, those who did not complete the doctoral degree cited responsibilities of full-time employment as an obstacle, impediment, or reason for dropping out (Grissom, 1985; Lenz, 1994; McCabe-Martinez, 1996; O'Bara, 1993; Reamer, 1990; Reeble, 1975; Sauer, 1986; Schultz, 1983; Swoboda, 1978; Whitacre, 1987). Job responsibilities emerged as the most significant factor affecting degree progress and completion in the interview portion of a mixed-design study by McCabe-Martinez (1996) of Hispanic public school personnel. The students who did not complete doctoral degrees in McCabe-Martinez's study reported that their employment impeded their progress, while those who did complete reported that their employment was an enhancement to their progress. While this may seem contradictory, the implication is that the responsibilities of employment can work either way depending upon the circumstances -- they can either enhance or impede progress toward the degree.

Financial problems and pressures and insufficient finances were cited as situational barriers to completion in several studies (Jones, 1987; Leadabrand, 1985; Lemley, 1976; Lenz, 1994; Lovitts, 1996; Murrell, 1987; Reeble, 1975; Whitacre, 1987). However, although financial difficulties were present, they were not always found to be significant as actual impediments to persistence (Boozer, 1972; Campbell, 1992; Dolph, 1983; Girves & Wemmerus, 1988).

Personal and Psychological Variables Represent a Relatively New Direction in the Study of Doctoral Student Attrition and Persistence

Particularly over the past decade, researchers have had a growing interest in looking within the individual to study psychological factors and characteristics of doctoral students and how these affect attrition and persistence (Weiss, 1987; Wentzel, 1987; Germeroth, 1991). Four personal or psychological characteristics are covered in this section -- student motivation, goal directedness, self concept, and wellbeing -- other, less-studied characteristics are briefly described.

Doctoral student motivation was examined in almost one-fourth of the studies included in this meta-synthesis (Bauer, 1997, Butler, 1995; Clewell, 1987; Decker, 1972, 1973; Ferrer de

Valero, 1996; Frasier, 1993; Grissom, 1985; Hassan-Shahriari, 1983; Hirschberg & Itkin, 1978; Hugeley, 1988; Lees, 1996; Lovitts, 1996; Macht, 1978; Mah, 1986; McCabe-Martinez, 1996; Nagi, 1974; Porozny, 1970; Schultz, 1983; Skudlarek, 1992; Swoboda, 1978). By and large, researchers found motivation to be strongly related to doctoral degree completion. For instance, lack of motivation was cited as being the single most important factor connected to attrition in Nagi's study (1974), where both completers and non-completers indicated that "motivation or the lack of motivation was the dominant personal reason for either completion or non-completion of the doctoral program" (p. 61). Frasier's study (1993) was the only one in which personal motivation was not found to be a significant factor. Her study was distinct, however, in that it involved only those graduates and non-graduates who had achieved ABD status.

In Decker's (1972) study, "motivation and commitment" were treated as one variable and found to be a major if not dominant element in persistence. Other researchers have found commitment to relate to persistence as well (Cooke, Sims, & Peyrefitte, 1995; Dorn, 1995; Dorn, Papalewis & Brown, 1995; Lawson, 1985; Leadabrand, 1985; Reamer, 1990). Students who have a "never give up" attitude are more likely to complete the doctorate than others (Brien, 1992; Clewell, 1987; Mah, 1986; Reamer, 1990). As Reamer (1990) found:

> Although most persisters confessed to having wanted to leave their programs, they also overwhelmingly stated that it was their unwillingness to experience failure that kept them in school. This suggests a determination to succeed against all odds, which may be a personal quality that helps students to persist. One persister said he stayed in the program because "I really wanted that degree. I really like to face up to a challenge." (p. 23)

The importance that students place on the doctoral degree for attainment of their career goals was among the most important predictors of persistence identified by Lemp (1980). Similarly, Brien (1992) found that the "belief in what the doctorate could do for one's career aspirations" was important and that "if one believes the degree will in fact 'open new doors' or 'give ... credibility,' then it was more likely that students 'would diligently continue in the doctoral program'" (p. 104). Other studies in which career goals were found to be significantly related to

doctoral persistence included those by Boozer (1972), Delaney (1981), Hassan-Shahriari (1983), Lovitts (1996), Mah (1986), Nerad and Cerny (1991), Swoboda (1978), and White (1986).

The significance of student self-image or self-concept to doctoral student completion remains uncertain (Hassan-Shariari, 1983; McCabe-Martinez, 1996; Reiff, 1992; Benkin, 1984; Swoboda, 1978). Bishop (1981) and Presley (1996) have found that students' positive views of themselves may relate to the successful completion of the doctorate, while students' negative views of themselves may relate to withdrawal. Further, they have found no significant difference between completers and non-completers with respect to self-concept (Bishop, 1981; Presley, 1996).

Studies reviewed differ considerably regarding issues of health and well-being. To illustrate, health problems and illness were given as a reason for student withdrawal by Lovitts (1996), while they were not found to be a significant variable in Grissom's study (1985). Dolph (1983) did not find a significant difference between successful degree completers and non-completers with regard to emotional problems among educational administration majors, but Campbell (1992) did in his study of educational leadership majors. Surprisingly few studies dealt with stress, although Frasier (1993), in a survey research study employing logistic regression analysis, found "emotional stress due to fear of failure, stress or role conflict" to be one of five most significant reasons for dropping out. Likewise, Wood (1978) found that doctoral recipients experienced fewer critical, stressful periods than did dropouts.

Findings of the preceding studies indicate that there are potentially-meaningful relationships between certain individual, personal characteristics and doctoral student persistence. These and other personal variables are endogenous to individuals and, therefore, rest outside of the realm of influence of colleges and universities. Nonetheless, they represent an emerging area of research focused on doctoral students with relevance to learning, teaching, advising, and administration that is worthy of further study.

Demographic Variables do not Conclusively Distinguish Persisters From Those Who Drop Out

Demographic variables have been studied widely over the years, in that they have been fairly standard items included on surveys as demographic data. Because they occur so frequently

in the research, the following are discussed here: age, children and family, full-time or part-time enrollment status, race, and sex.

A substantial body of evidence indicates that age is not a statistically significant variable in discriminating between those who earn the doctorate and those who do not (Bishop, 1981; Campbell, 1992; Dolph, 1983; Ducette, 1990; Dunnerstick, 1990; Flores, 1984; Franklin, 1970; Frasier, 1993; Girves & Wemmerus, 1988; Muhic, 1971; Ott, Markewich, & Ochsner, 1984; Quinn, 1991; Delaney, 1981; Dolph, 1983; Mah, 1986; Vacc & Picot 1984; Valentine, 1986, 1987). In a few studies younger students were more likely to graduate (Cook & Swanson, 1978; Skudlarek, 1992; Wagner, 1986), while in a few others higher levels of degree completion were found among older students (Artiga, 1983; DeStigter, 1983).

The weight of the evidence in this study indicates that the number of children or dependents of doctoral students is not a significant predictor of persistence or attrition (Dolph, 1983; Flores, 1984; Franklin, 1970; Frasier, 1993; Macht, 1978; Muhic 1971; Valentine, 1986, 1987). Similarly, in the majority of studies, marital status was not related significantly to either persistence or attrition (Dolph, 1983; Franklin, 1970; Frasier, 1993; Girves & Wemmerus, 1988; Valentine, 1986, 1987; Wagner, 1986). There were studies in which marriage was shown to be positively related to persistence (Harris, 1976; Lemp, 1980; Lunneborg & Lunneborg, 1973), but these were counterbalanced by other studies indicating that single individuals were more likely to complete the doctorate (Flores, 1984; Hagedorn, 1993; Schmersahl, 1974).

Several studies in this sample examined full- versus part-time status and its relationship to doctoral attrition or persistence (Cook & Swanson, 1978; Dolph, 1983; Franklin, 1970; Presley, 1996; Quinn, 1991; Valentine, 1986, 1987). The findings of these studies were split -- that is, roughly half of the studies found full-time enrollment to be positively related to doctoral student degree completion, while the other half found no significant difference between degree completion and full-time status.

The majority of studies indicate that gender is not significantly related to doctoral degree completion (Bishop, 1981; Bowen & Rudenstine, 1992; Campbell, 1992; Cooper, 1996; Delaney, 1981; DeStigter, 1983; Dolph, 1983; Ducette, 1990; Dunnerstick, 1990; Franklin, 1970; Frasier,

1993; Girves & Wemmerus, 1988; Grissom, 1985; Gunn & Sanford, 1988; Mah, 1986; Muhic, 1971; Ott, Markewich, & Ochsner, 1984; Quinn, 1991; Vacc & Picot, 1984; Wagner, 1986). Once again, males were found to be more likely to graduate than females in some studies (Abedi & Benkin, 1987; Artiga, 1983; Boozer, 1972; California State Postsecondary Education Commission, 1990; Cook & Swanson, 1978; Decker, 1973; Gillingham, Seneca & Taussig, 1991; Hirshberg & Itkin, 1978; Lemley, 1976; Lemp, 1980; Lunneborg & Lunneborg, 1973; Naylor & Sanford, 1982; Schmersdahl, 1974; Zwick, 1991), while females were found to be more likely to graduate than males in other studies (Sauer, 1986; Williams, Harlow, & Gab, 1970).

Completion rates do not appear to vary based on race or ethnicity (Anderson & Hrabowski, 1977; Cooke, Sims, & Peyrefitte 1995; Davis, 1981; Delaney, 1981; Dolph, 1983; Frasier, 1993; Girves & Wemmerus,1988; Mah, 1986; Ott, Markewich, & Ochsner, 1984; Presley, 1996; Quinn, 1991; Vacc & Picot, 1984). In this sample, only a few studies were identified that found a significant difference in completion rates among racial groups (Clewell, 1987; Matchett, 1988; Zwick, 1991).

Retention Rates Vary Widely Among Institutions

Just how serious of a problem is doctoral student attrition? In this sample, fewer than one-third of the studies reported some type of information about retention or attrition rates. In some instances, the information was a single, general retention or attrition rate (see Tables 5 and 6). In others, various ways of describing attrition and persistence were used; for example, a retention rate was given for only those students who had passed the qualifying exam (Quinn, 1991) or reached ABD status (Campbell, 1992; Cook & Swanson, 1978; Frasier, 1993; Grissom, 1985; Hobish, 1978, 1979). Retention rates were reported for stages of departure (Ferrer de Valero, 1996; Huang, 1995; McCabe- Martinez, 1996; Reamer, 1990), for males and females separately (Dolph, 1984; Golde & Petrides, 1996), and for races separately (Davis, 1981). As was seen in Table 1, a number of researchers have presented attrition data disaggregated by field of study.

In some studies, retention refers to actual doctoral student degree completion; in others, retention is meant to include not only those who completed their degrees, but also those still

enrolled. In others, the retention rate is given, accompanied by a notation as to what percent of students are still enrolled. Yet other studies analyze retention rates after an elapsed period of

TABLE 5. Doctoral Level Retention Statistics

Author	Program(s)	University(ies)	Cohort Years	Retention Rate
Abraham 1979	All Programs	Research I	1963-1969, studied in 1979	61%
Benkin 1984	58 Majors	Research I	1969-1971, studied in 1984	68%
Bowen & Rudenstine 1992	6 Fields	10 Research I	1960s-1980s, studied in 1990	58.8%
Cook & Swanson 1978	Educational Administration	Research I	1964-1978, studied in 1978	57%
Decker 1973	Economics	Research I	1956-1966, studied in 1971	32%
Ferrer de Valero 1996	57 programs	Research I	1986-1990, studied in 1995	45%
Golde 1995	4 disciplines	Research I	1984-1989, studied in 1995	62.27%
Gunn & Sanford 1988	North Carolina Higher Ed. Data Base	Research I	1974, studied after 8 and 11 years	53.8% after 8 68.0% after 11
Lunneborg & Lunneborg 1973	Psychology	Research I	1963-1967, studied after 4 years	29%
McCabe-Martinez 1996	Education	Research I	1985, studied in 1995	68.6%
Murrell 1987	6 Education Programs	Research I	1975-1980, studied in 1986	59%
Naylor & Sanford 1982	All doctorate	Research I	1974, studied in 1980	59.4%
Nerad & Cerny 1991	All doctorate	Research I	1978-1979, studied in 1989	58%

time, permitting the classification of doctoral students into two groups -- those who completed and those who did not.

Retention statistics from studies in this sample are contained in Table 5. The collection points and inclusive cohort years differ widely, as do programs and universities included. Given that, this table presents the range of retention rates. It can be said that the range of reported retention rates extends from a low of 29% to a high of 68.8%. In the study reporting the lowest retention rate (Lunneborg & Lunneborg, 1973), the cohort group members were psychology doctoral students who were given four years to complete; the study was of a single Research I university. The study reporting the highest completion rate (McCabe-Martinez, 1996) was of Hispanic public school personnel hand-picked by their superintendents to study at a Research I university, analyzed 10 years after admission to the program. It is interesting to note that 21.6% were still in the program, 5.9% were at the dissertation stage, and only 3.9% had actually dropped out. These examples illustrate how widely the cohort samples and approaches for reporting retention statistics vary in the literature. Several researchers have used attrition rates rather than retention rates to report student persistence outcomes (See Table 6).

Table 6. Doctoral Level Attrition Statistics

Author	Programs Studied	Universities	Cohort Years	Attrition Rate
Benkin 1984	58 majors	Research I	1969-1971 studied in 1984	32%
Dolph 1984	Educational Administration	Doctoral I	1970-1980	45%
Ducette 1990	Educational Administration	Doctoral I	1972-1983 studied in 1990	61%
Jones 1987	Counseling Psychology	Doctoral I	1970-1980 studied in 1986	18%

ABD is not the Stage Where the Greatest Proportion of Doctoral Students Necessarily Departs

Doctoral students who are ABD are, perhaps, at the most visible stage from which to withdraw from doctoral study. However, ABD is not the stage at which the greatest proportion

of doctoral students necessarily departs. Indeed, according to several researchers, as much as two-thirds of doctoral attrition occurs prior to the achievement of ABD status (Benkin, 1984; Bowen & Rudenstine, 1992; Cook & Swanson, 1978; Golde, 1995; Nerad & Cerny, 1993).

Bowen and Rudenstine (1992) identified three stages of attrition: pre-second year, after second year but pre-ABD, and ABD. In their research on six fields of study at ten Research I universities, they found that 87.0% of doctoral students returned to start their second year; 69.9% achieved ABD status, and 56.6% completed the degree. Similarly, in their study of doctoral programs at a Research I university, Nerad and Cerny (1991) concluded, "Contrary to popular belief, the majority of the graduate students who failed to earn their doctorates left the program before advancement to the candidacy for the Ph.D., not after" (p. 2). In their study, 24% of students were found to have left doctoral study during the first three years,[3] while another 10% left after advancement to candidacy and 8% were still pending.

While few researchers included in this meta-synthesis looked at stages of attrition, those who did found consistent results. It appears to be important to continue to examine the stages at which doctoral students withdraw, based on these research studies, in order to gain a complete perspective on doctoral student attrition and persistence.

Time to Degree is Related to Attrition

Recent studies have shown that the longer the time spent in graduate school, the greater the chance that students will not persist to the degree (Bowen & Rudenstine, 1992; Ferrer de Valero, 1996; Frasier, 1993; Hirschberg & Itkin, 1978; Nerad & Cerny, 1991; Tuckman, Coyle, & Bae, 1989, 1990). This finding went uncontested in this research, despite the small number of studies that examined this particular variable. That said, this appears to be a strong finding because of the scope of the studies which support this conclusion. For example, Bowen and Rudenstine's (1992) study is of ten major universities and six fields of study, Ferrer de Valero's (1996) is of 57 disciplines at a major university. There is a very large body of research literature

[3]Nerad and Cerny reported that of the 24% who left during the first three years, 83% had earned master's degrees.

that exists on the subject of doctoral time to degree. However, this section looked at TTD only as it relates to attrition and persistence.

Doctoral Programs That are Smaller in Terms of the Entering Cohorts Have Consistently Lower Time-to-Degree and Consistently Higher Completion Rates Than Those Programs With Larger Entering Cohorts

Entering cohort size and its relationship to attrition and persistence is the final theme of this meta-synthesis. This theme is included not because of its occurrence in multiple studies, but because of the endorsement it was given as a variable studied in Bowen and Rudenstine's (1992) study and because it is not a variable likely to occur in research where only small programs or only large programs are being studied. As mentioned earlier, Bowen and Rudenstine studied 10 institutions and 6 programs of study; they found that "graduate programs with relatively small entering cohorts have consistently higher completion rates and lower TTD than those with larger entering cohorts" (p. 11) and that this finding held across stages of attrition. According to Bowen and Rudenstine, this was "one of the most important findings" (p. 149) of their study. To be sure, although only one study has identified program size as a potentially important factor in doctoral student persistence, the scope of Bowen and Rudenstine's research strongly suggests that this is a finding that is deserving of more study in the future.

Recommendations for Research and Policy Implications

This study focused on the synthesis of a large number of research findings on doctoral student attrition and persistence in an effort to discern and present those factors that appear to make a difference in the retention of doctoral students. The key findings from this approach have been presented, as have sub-categories of findings.

An over-arching finding of this meta-synthesis is that the circumstances surrounding both attrition and persistence are highly complex. No single variable explains doctoral student attrition or persistence; rather, several variables are at play.

Despite the large number of research studies that have already been completed, the complexity inherent in doctoral student attrition and persistence offers several avenues for further

study. Many of these were discussed in the previous section. Additionally, research of a general nature is needed to help fill gaps in the current literature.

Ideally, a national data base should be established for the tracking and monitoring of all those who enter doctoral study, such as the National Research Council (1997) data base now does for those who graduate. Through a data base, a better understanding of the gravity and complexity of the problem could be reached. Patterns could be observed year to year, and analyses by field of study would be possible. Also, consistent information would be available across institutions, making comparisons possible.

Because researchers in large measure have relied upon survey research methods to study doctoral student attrition and persistence have been of survey research at single institutions (and focused on single programs of study), there exists a strong need for qualitative research that seeks to gain directly from students their thoughts, feelings, and behaviors regarding continuation or attrition. Such studies have the potential to shed more light on the importance of previously-identified variables as well as surface new factors or combinations of factors that play an central role in attrition and in retention. Whether single- or multi-institutional investigations, qualitative studies are likely to provide rich descriptions that are currently missing from many of the available findings. Additionally, qualitative research results could also be used to inform survey research. The wealth of information implicit in the lived experiences of doctoral students holds the potential to open up research on many other fronts.

Longitudinal studies are also needed which take into account stages of degree progress and field of study. Such studies would naturally address stages of attrition and would operate from the assumption that attrition is variant across the process of doctoral work. Longitudinal studies would also operate apart from the *ex post facto* realm, which has heretofore been the predominant way in which doctoral student attrition and persistence have been studied. Ex *post facto* research has the major limitation of asking students to reflect back on their experiences after the passage of a period of time. In contrast, longitudinal studies could examine experiences at points in time along the path toward the doctoral degree, linking those experiences to the ultimate outcomes which are graduation, leave of absence, or withdrawal from doctoral studies. Ideally,

longitudinal studies should be conducted across institutions and fields and programs of study in an effort to produce robust and generalizable findings.

While there are many gaps to fill in the body of research on doctoral student attrition and persistence, this study has also produced findings that have policy implications for faculty and administrators concerned about strengthening doctoral student retention on their own campuses. Two such policy implications merit attention here.

First, faculty and administrators need to take seriously the task of collecting institutional information in order to acquire a longitudinal understanding of the data and patterns surrounding their own students. Some institutions, of course, have mechanisms for the routine collection and analysis of doctoral student attrition and retention information already in place, but it appears that many do not.

Institutional and programmatic self-assessment can best serve institutions in the formation of policies and practices when it is fashioned around mixed methodologies. By using quantitative and qualitative approaches, the voices and viewpoints of students as well as official data can be analyzed and tracked. An excellent example of this is taking place at the University of California at Berkeley (Nerad & Cerny, 1991), where the methods include a combination of statistical analysis of demographic data, comparisons with at least one other Research I university engaged in similar institutional research, interviews with students, and survey research. At Berkeley, the information gathered has been used to create a retention model for the university as well as to develop recommendations and draft policy with regard to doctoral study.[4]

Second, if they are not already in the practice of doing so, institutions and their schools, programs, departments and faculty can conduct self-examinations in light of some of the findings that are present in the research literature and adopt new policies or practices that could benefit doctoral students and foster persistence. Although many of the variables related to student

---

[4]At Berkeley, Nerad and Cerny (1991) have looked by department at: the mode in which student research takes place (apprenticeship, laboratory, no structure, etc.), whether a Master's degree is required, the structure of the program, the definition of dissertation, the level of advising and mentoring that takes place, factors related to department climate, availability of research money, types of financial support, campus facilities, and the job market in their comparative analyses (p. 4).

attrition and persistence rest outside the realm of university influence, there are also areas where influence can be exerted. It is quite feasible for faculty and administration to assess what "cultural" aspects of their departments/programs are -- and are not -- working well by systematically surveying students about professional development opportunities, student activities, orientation, opportunities for social and academic involvement, and communication practices. Faculty (as individuals and collectively) can examine their portion of the faculty/student relationship in light of the findings, from teaching through dissertation advisement. Financial aid policies and practices can be examined, as can other departmental and institutional policies and practices that may relate to improved doctoral student retention.

The above recommendations are made in the spirit of linking research, theory, practice, and policy. Tinto (1987/1993) has said that retention "must focus on the institution as well as on the student, and on the actions of the faculty and staff who are the representatives of the institution; ... that it arises from and is demonstrated in the everyday interaction among students, faculty, and staff in the formal and informal domains of institutional life" (p. 201). This study supports that statement in large measure, but it also points to the need to further understand the complexity of factors that accompany the question: Why do so many doctoral students depart without completing the degree?

References

Abedi, J., & Benkin, E. (1987). The effects of students' academic, financial, and demographic variables on time to the doctorate. Research in Higher Education, 27(1), 3-14.

Abraham, K. A. (1979). The graduate record examination aptitude test scores as predictors of success for doctoral candidates at the University of Mississippi (Doctoral dissertation, University of Mississippi, 1979). Dissertation Abstracts International, 40(04A).

Allen, W. R., Haddad, A., & Kirkland, M. (1984, November). Preliminary report: 1982 graduate professional survey, national study of black college students. Ann Arbor, MI: The University of Michigan Center for Afro-American and African Studies. Unpublished Report.

Anderson, E. F., & Hrabowski, F. A. (1977). Graduate school success of black students from white and black colleges. Journal of Higher Education, 58(3), 294-303.

Artiga, A. (1984). A descriptive study on patterns of completion and attrition at the multicultural education doctoral program (Doctoral dissertation, University of San Francisco, 1983). Dissertation Abstracts International, 44(12A), 3605.

Bauer, W. C. (1997). Pursuing the Ph. D.: Importance of structure, goal-setting and advising practices in the completion of the doctoral dissertation. (Doctoral dissertation, University of California, Los Angeles). Dissertation Abstracts International, 58(O6A).

Benkin, E. M. (1984). Where have all the doctoral students gone? A study of doctoral student attrition at UCLA (Doctoral dissertation, University of California, Los Angeles, 1984). Dissertation Abstracts International, 45(09A).

Berelson, B. (1960). Graduate education in the United States. New York: McGraw-Hill.

Berg, H. M., & Ferber, M. A. (1983). Men and women graduate students: Who succeeds and why? Journal of Higher Education, 54(6), 629-648.

Berry, M. D. (1994). Perceptions of educational administration professors about factors which affect doctoral attrition (Doctoral dissertation, New Mexico State University, 1993). Dissertation Abstracts International, 54(08A).

Bishop, A. E. (1981). The effect of fear of success on completion of the doctorate (Doctoral dissertation, University of Southern California, 1981). Dissertation Abstracts International, 42(06A).

Bodian, L. H. (1987). Career instrumentality of degree completion as a factor in doctoral student attrition (Doctoral dissertation, University of Maryland, College Park, 1987). Dissertation Abstracts International, 48(08B).

Boozer, J. S. (1972). Dropouts and Ph. D.'s from the Emory University Graduate School of Arts and Sciences, 1962-1968 (Doctoral dissertation, Emory University, 1972). Dissertation Abstracts International, 33(06A).

Bowen, W. G., & Rudenstine, N. L. (1992). In pursuit of the PhD. Princeton, NJ: Princeton University Press.

Brien, S. J. (1992). The adult professional as graduate student: A case study in recruitment, persistence, and perceived quality (Doctoral dissertation, Northern Illinois University, 1992). Dissertation Abstracts International, 53(07A).

Burnham, P., & Hewitt, B. (1972). Quantitative factor scores as predictors of general academic promise. Educational and Psychological Measurement, 32, 403-410.

Butler, J. N., Jr. (1996). Individual and institutional factors related to successful completion of a doctoral degree in agricultural education (Doctoral dissertation, Mississippi State University, 1995). Dissertation Abstracts International, 56(10A).

Bybee, J. R. (1972). Prediction in the College of Education Doctoral Program at the Ohio State University (Doctoral dissertation, The Ohio State University, 1972). Dissertation Abstracts International, 33(08A).

Campbell, R. B. (1992). A study of the completion and non-completion of the Doctor of Education degree in Educational Leadership at the University of Delaware (Doctoral dissertation, University of Delaware, 1992). Dissertation Abstracts International, 53(06A).

Carlson, S. L. (1995). An examination of the external factors that influence midlife women's behavior to persist in obtaining a graduate degree (Doctoral dissertation, The Ohio State University, 1995). Dissertation Abstracts International, 56(09).

Carrington, S. H., & Sedlacek, N. E. (1976). Attitudes and characteristics of black graduate students. College Park, MD: Maryland University Cultural Study Center. (ERIC Document Reproduction Service No. ED 132234).

Clewell, B. C. (1987). Retention of Black and Hispanic doctoral students. GRE Board Research Report No. 83-4R. Princeton, NJ: Educational Testing Service. (ERIC Document Reproduction Service No. ED 285466).

Cook, M., & Swanson, A. (1978). The interaction of student and program variables for the purpose of developing a model for predicting graduation from graduate programs over a 10-year period. Research in Higher Education, 8(1), 83-91.

Cooke, D. K., Sims, R. L., & Peyrefitte, J. (1995). The relationship between graduate student attitudes and attrition. Journal of Psychology, 129(6), 677-689.

Cooper, B. C. (1996). Faculty characteristics associated with retention of doctoral students (Doctoral dissertation, Louisiana State University and Agricultural and Mechanical College, 1996). Dissertation Abstracts International, 57(09A).

Daniels-Nelson, M. D. (1983). Doctoral candidates' and graduates' perceptions of advisor-advisee relationships in selected areas of education at The Ohio State University (Doctoral dissertation, The Ohio State University, 1983). Dissertation Abstracts International, 44(09A).

Darlington, P. E. (1970). An analysis of the obstacles perceived by graduate students as delaying their progress to the Ph.D. (Doctoral Dissertation, University of Michigan, 1970). Dissertation Abstracts International.

Davis, R. J. (1981). Selected factors influencing the selection, academic achievement, and career development of Black doctoral students and doctoral-degree recipients in industrial education (Doctoral dissertation, The Ohio State University, 1981). Dissertation Abstracts International, 42(03A).

Decker, R. L. (1973). Success and attrition characteristics in graduate studies. Journal of Economic Education, 4, 130-137.

Decker, R. L. (1972, March). Determinants of success in economic education. Western Economic Journal, Agora, 10, 110.

Delaney, F. H. (1981). Factors affecting attrition or successful degree completion among doctoral candidates at Boston College, 1972-1978 (Doctoral dissertation, Boston College, 1981). Dissertation Abstracts International, 42(11A).

Denmon, A. L. (1987). The graduate school environment: Student satisfaction and involvement as predictors of academic success (Doctoral dissertation, Texas Southern University, 1987). Dissertation Abstracts International, 49(05).

Destigter, L. L. (1983). A comparison of Ph.D. completers and non-completers in adult and continuing education at Michigan State University (Doctoral dissertation, Michigan State University, 1983). Dissertation Abstracts International, 44(07A).

Dickinson, W. C. (1983). Factors relating to attrition from and completion of the doctoral program in educational administration from the University of Pittsburgh (Pennsylvania) (Ph. D. Dissertation, University of Pittsburgh, 1983). Dissertation Abstracts International, 45(02A).

Dolph, R. F. (1983). Factors relating to success or failure in obtaining the doctorate (Doctoral dissertation, Georgia State University, 1983). Dissertation Abstracts International, 44(11A).

Dorn, S.M. (1995). Doctoral student perceptions of cohesiveness and its effect on persistence (Doctoral dissertation, University of California, Davis, 1995). Dissertation Abstracts International, 56(06A).

Dorn, S. M., Papalewis, R., & Brown, R. (1995). Educators earning their doctorates: Perceptions. Education, 116(2), 305-315.

Ducette, M. O. (1990). Variables influencing doctoral student graduation: A path analytic test of Tinto's process model (Doctoral dissertation, State University of New York at Buffalo, 1990). Dissertation Abstracts International, 52(06A).

Dunnerstick, R. (1990). Do admission criteria to the doctor of education in educational administration program predict completion? (Doctoral dissertation, University of Akron, 1990). Dissertation Abstracts International, 51(01A).

Ferrer de Valero, Y. J. (1996). Departmental factors affecting time to degree and completion rates of doctoral students at one land-grant, research institution. (Doctoral dissertation, Virginia Polytechnic Institute and State University, 1996). Dissertation Abstracts International, 57(09A).

Flores, L. J. (1984). A study of successful completion and attrition among Chicana Title VII bilingual education doctoral fellows at selected southwestern universities (Doctoral dissertation, New Mexico State University, 1985). Dissertation Abstracts International, 45(12A).

Foote, M. L. S. (1988). Persisters' and non-persisters' perceptions of institutional integration at the doctoral level (Doctoral dissertation, University of Connecticut, 1988). Dissertation Abstracts International, 49(08A).

Franek, S. A. (1982). ABD to Ph.D.: Counseling interventions to facilitate dissertation completion (Doctoral dissertation, University of Nebraska, 1982). Dissertation Abstracts International, 43(06B).

Franklin, J.B. (1970). Attrition and success of doctoral students in the educational administration department of Arizona State University (Doctoral dissertation, Arizona State University, Tempe, 1970). Dissertation Abstracts International, 31(08A).

Frasier, E. R. M. (1993). Persistence of doctoral candidates in the college of education, University of Missouri-Columbia (Missouri) (Doctoral dissertation, University of Missouri, Columbia, 1993). Dissertation Abstracts International, 54(11A).

Gell, S. K. (1995). Factors associated with completion or non-completion of doctoral dissertations: Self-direction and advisor/advisee congruity (Doctoral dissertation, University of Maryland, College Park, 1995). Dissertation Abstracts International, 56(11A).

Germeroth, D. (1991). Lonely days and lonely nights: Completing the doctoral dissertation. ACA Bulletin, 76, 60-89.

Gillingham, L., Seneca, J. J., & Taussig, M. K. (1991). The determinants of progress to the doctoral degree. Research in Higher Education, 32(4), 449-467.

Girves, J. E., & Wemmerus, V. (1988). Developing models of graduate student degree progress. Journal of Higher Education, 59(2), 163-189.

Glass, G. V. (1976). Primary, secondary, and meta-analysis of research. Educational Researcher, 5, 3-8.

Golde, C. M. (1994, November). Student descriptions of the doctoral student attrition process. Paper presented at the annual meeting of the Association for the Study of Higher Education (ASHE). Tucson, AZ. (ERIC Document Reproduction Service No. ED 375733)

Golde, C. M. (1995, November). Early and late doctoral student attrition: Descriptions of the graduate education process. Paper presented at the annual meeting of the Association for the Study of Higher Education (ASHE). Orlando, FL.

Golde, C. M. (1996). How departmental contextual factors shape doctoral student attrition (Doctoral dissertation, Stanford University, 1996). Diskettes received from author prior to publication.

Golde, C. M., & Petrides, L. A. (1996). Thinking about quitting. Paper presented at the annual meeting of the Association for Higher Education (ASHE), Memphis, TN.

Green, G. D. (1981). Dissertation procrastination (Doctoral dissertation, University of Washington, 1981). Dissertation Abstracts International, 42(04A).

Grissom, M. A. (1985). Attrition after successful completion of doctoral qualifying examinations: An analysis of characteristics and attitudes of doctoral graduates and non-graduates (Doctoral dissertation, University of North Texas, 1985). Dissertation Abstracts International, 46(09A).

Guba, E. G. (1978). Toward a methodology of naturalistic inquiry in educational evaluation. University of California, Los Angeles: Center for the Study of Evaluation.

Gunn, C. S., & Sanford, T. R. (1988, Summer). Doctoral student retention. College and University, 63(4), 374-382.

Hackman, J. R., & Dysinger, W. S. (1970). Commitment to college as a factor in student attrition. Sociology of Education, 43, 311-324.

Hackman, J. R., Wiggins, N., & Bass, A. (1970). Prediction of long-term success in doctoral work in psychology. Educational and Psychological Measurement, 30, 365-374.

Hagedorn, L. S., & Nora, A. (1996, Winter). Rethinking admissions criteria in graduate and professional programs. In J. G. Haworth (Ed.), Assessing graduate and professional education: Current realities, future prospects (New Directions for Institutional Research, No. 92). San Francisco: Jossey-Bass.

Hagedorn, L. S. (1993, November). Graduate retention: An investigation of factors relating to older female graduate students. Paper presented at the annual meeting of the Association for the Study of Higher Education (ASHE). (ERIC Document Reproduction Service No. ED 365181).

Harris, C. (1976). Selection criteria and procedures for predicting the success of industrial education doctoral applicants (Doctoral dissertation, Michigan State University, 1976). Dissertation Abstracts International, 37(06A).

Hassan-Shahriari, F. Z. (1983). An analysis of factors relating to the attrition rate of doctoral students at the dissertation level at the school of education and human development of the George Washington University (Doctoral dissertation, George Washington University, 1983). Dissertation Abstracts International, 44(04A).

Heiss, A. M. (1970). Challenges to graduate schools: The Ph.D. program in ten universities. San Francisco: Jossey-Bass.

Hirschberg, N., & Itkin, S. (1978). Graduate student success in psychology. American Psychologist, 33, 1083-1093.

Hite, L. M. (1985). Female doctoral students: Their perceptions and concerns. Journal of College Student Personnel, 26(1), 28-32.

Hobish, T. T. (1979). An abstract of a study of selected psychological factors related to completion or non-completion of the doctoral dissertation among male and female doctoral degree candidates. (ERIC Document Reproduction Service No. ED 188552).

Hobish, T. T. (1978). A study of selected psychological factors related to the completion or non-completion of the doctoral dissertation among male and female doctoral degree candidates (Doctoral dissertation, New York University, 1978). Dissertation Abstracts International, 39(04B).

Hochberg, C. K. (1972). Predictive effectiveness of the Miller Analogies Test and other variables for doctoral degree students in the School of Education at Fordham University (Doctoral dissertation, Fordham University, 1972). Dissertation Abstracts International, 33(01A).

Howard, R. K. (1981). A follow-up study of doctoral attrition in the College of Education (Doctoral dissertation, Florida State University, 1981). Dissertation Abstracts International, 42(08A).

Huang, L. (1995). Minority graduate educational persistence: A study of CIC Fellows (Doctoral dissertation, Purdue University, 1995). Dissertation Abstracts International, 56(07A).

Huguley, S. (1988). An investigation of obstacles to completion of the dissertation and of doctoral student attitudes toward the dissertation experience (Doctoral dissertation, Pepperdine University, 1988). Dissertation Abstracts International, 50(02A).

Jacks, P., Chubin, D. E., Porter, A. L., & Connolly, T. (1983). The ABCs of ABDs: A study of incomplete doctorates. Improving College and University Teaching, 31(2), 74-81.

Jones, G. B., Jr. (1987). Eleven years of admissions to the Temple University Program in Counseling Psychology, 1970-1980: A study in degree completion (Doctoral dissertation, Temple University, 1987). Dissertation Abstracts International, 48(02B).

Karolyi, M. S. (1993). All but the dissertation: Perceptions of ABD level attrition among faculty, alumni, and ABDs in a graduate school of education at a large, public, Midwestern university (Doctoral dissertation, Kent State University, 1993). Dissertation Abstracts International, 54(09A).

King, S. E. (1994). African-American women and doctoral study: Three case studies. (ERIC Document Reproduction Service No. ED 369737).

Kleuver, R. (1995, April). ABDs and graduates from a college of education: Responsibility, barriers and facilitators. Paper presented at the annual meeting of the American Educational Research Association (AERA), San Francisco. (ERIC Document Reproduction Service No. ED 382143).

Krauskopf, C. (1973). The shape of the MAT/PhD relation. Measurement and Evaluation in Guidance, 5, 502.

Lawson, L. G. (1985). Doctoral student attrition: A role theory approach (Doctoral dissertation, University of California, Santa Barbara, 1985). Dissertation Abstracts International, 46(06), 1532A.

Leadabrand, J.A. (1985). Doctoral candidate persistence in community and human resources: A replica of Pascarella and Terenzini's studies based on Tinto's concept (Doctoral dissertation, University of Nebraska, 1985). Dissertation Abstracts International, 46(08A).

Lees, K. A. (1996). Understanding how female doctoral student interactions with their chairpersons during the dissertation process affect doctoral persistence (Doctoral dissertation, University of Northern Colorado, 1996). Dissertation Abstracts International, 58(02A).

Lemley, N. C. (1976). A follow-up study of the inactive doctoral students in the Department of Educational Administration and Supervision at the University of Southern Mississippi. Dissertation Abstracts International, 37(04A).

Lemp, P. H. (1980). Determinants of persistence in graduate education: The doctoral student (Doctoral dissertation, Stanford University, 1980). Dissertation Abstracts International, 41(05A).

Lenz, K. S. (1994). A multiple case study examining factors affecting the completion of the doctoral dissertation by academically able women (Doctoral dissertation, University of Denver, 1994). Dissertation Abstracts International, 55(12A).

Lincoln, Y. S., & Guba, E. G. (1985). Naturalistic inquiry. Beverly Hills, CA: Sage.

Long, J. B. (1987). Factors related to attrition and success in degree and non-degree doctoral students in education (Doctoral dissertation, Northern Arizona University, 1987). Dissertation Abstracts International, 48(10A).

Long, T. T., Convey, J. J., & Chwalek, A. R. (1985). Completing dissertations in the behavioral sciences. San Francisco: Jossey-Bass.

Lovitts, B. E. (1996). Leaving the ivory tower: A sociological analysis of the causes of departure from doctoral study (Doctoral dissertation, University of Maryland, College Park, 1996). Dissertation Abstracts International, 57(12A).

Lunneborg, C. E. (1972). Doctoral study attrition in psychology (Doctoral dissertation, Washington University, 1972). Dissertation Abstracts International.

Lunneborg, C. E. & Lunneborg, P. W. (1973). Doctoral study attrition in psychology. Research in Higher Education, 1, 379-387.

Lussier, T. G. (1995). Doctoral students at the University of Manitoba: Factors affecting completion rates and time to degree by gender and by field of study (Master's thesis, University of Manitoba). (ERIC Document Reproduction Service ED 382148).

Macht, M. W. (1978). Determinants of completion in doctoral education: An evaluation of a social work program (Doctoral dissertation, University of Wisconsin, 1978). Dissertation Abstracts International, 39(06A).

Mah, D. M. (1986). The process of doctoral candidate attrition: A study of the ABD phenomenon (Doctoral dissertation, University of Washington, 1986). Dissertation Abstracts International, 47(12A).

Magner, D. K. (1996, June 14). Study of Ph. D.'s finds record number of black doctorates. Chronicle of Higher Education, A25.

Malaney, G. D. (1988a). A decade of research on graduate students: A review of the literature in academic journals. Paper presented at the annual meeting of the Association for the Study of Higher Education (ASHE). Baltimore, MD. (ERIC Document Reproduction Service No. ED 292383).

Malaney, G. D. (1988b). Graduate education as an area of research in the field of higher education. In J. C. Smart (Ed.), Higher education: Handbook of theory and research: Vol. IV (pp. 397-454). New York: Agathon.

Mann, C. M. (1977, September). Quantitative evaluation of applicants for graduate school. Journal of Geological Education, 25, 118-119.

Manzo, K. K. (1994). Flaws in fellowships: Institutional support essential to boosting number of African American doctoral students. Black Issues in Higher Education, 11(10), 46-52.

Mariano, C. M. (1993). A study of Ed.D.s, Ph.D.s, and ABDs in Educational Administration (Doctoral dissertation, Boston College, 1993). Dissertation Abstracts International, 54(06A).

Matchett, W. (1988). A study of attrition among graduate students at New Mexico State University. Las Cruces, NM. (ERIC Document Reproduction Service No. ED 298811).

McCabe-Martinez, M. C. (1996). A study of perceptions of factors that enhanced and impeded progress toward the completion of the doctoral degree in education for Hispanic students employed in the public school systems (Doctoral dissertation, Boston College, 1993). Dissertation Abstracts International, 57(07A).

Miles, M. B., & Huberman, A. M. (1984/1994). Qualitative data analysis: An expanded sourcebook (2nd. Ed). Newbury Park, CA: Sage.

Miller, J. P. (1967). Drop-out and stretch-out: Reforming the Ph. D. Ventures, 7(2), 1-10.

Miller, M. M. (1995, April). ABD status and degree completion: A student's perspective. Paper presented at the annual meeting of the American Educational Research Association (AERA), San Francisco.

Mooney, C. J. (1990, April 25). Universities awarded record number of doctorates last year; foreign students thought to account for much of the increase. Chronicle of Higher Education, 1, 11, 18.

Mooney, J. (1968). Attrition among Ph. D. candidates: An analysis of a cohort of recent Woodrow Wilson Fellows. Journal of Human Resources, 3(1), 47-62.

Muhic, J. J. (1971). Prediction of success for doctoral degree in physical education (Doctoral dissertation, University of Utah, 1971). Dissertation Abstracts International, 32(06A).

Murrell, J. P. (1987). A study of barriers perceived as having impact on degree attainment by doctoral students (Doctoral Dissertation, Texas A and M University, 1987). Dissertation Abstracts International, 48(04A).

Muszynski, S. Y. (1988). The relationship between demographic/situational factors, cognitive/affective variables, and needs and time to completion of the doctoral program in psychology (Doctoral dissertation, Kent State University, 1988). Dissertation Abstracts International, 50(03B).

Nagi, J. L. (1974). Attrition factors in the Ed. D. program in Educational Administration at State University of New York at Albany (Doctoral dissertation, State University of New York at Albany, 1974). Dissertation Abstracts International, 35, 1465A.

Nagi, J. L. (1975). Predictive validity of the GRE and MAT. Educational and Psychological Measurements, 35, 471-472.

National Research Council (1997). Summary Report 1996: Doctorate recipients from United States universities. Washington, D. C.: National Academy Press.

Naylor, P. D., & Sanford, T. R. (1982). Intrainstitutional analysis of student retention across student levels. College and University, 57(2), 143-159.

Nelson, J. D. (1991). Coping resources, locus of control and program satisfaction among doctoral students in a college of education. Dissertation Abstracts International, 52(05A).

Nerad, M., & Cerny, J. (1993). From facts to action: Expanding the graduate division's educational role. In L. Baird (Ed.), Increasing graduate student retention and degree attainment. New Directions for Institutional Research (No. 80, pp. 27-40). San Francisco: Jossey-Bass.

Nerad, M., & Cerny, J. (1991, May). From facts to action: Expanding the role of the graduate division. CGS Communicator.

Nettles, M. T. (1990). Success in doctoral programs: Experiences of minority and white students. American Journal of Education, 98(4), 494-522.

Noblit, G. W., & Hare, R. D. (1988). Meta-ethnography: Synthesizing qualitative studies. Newbury Park, CA: Sage.

O'Bara, C. C. (1993). Why some finish and why some don't: Factors affecting Ph. D. degree completion (Doctoral dissertation, Claremont Graduate School, 1993). Dissertation Abstracts International, 54(06A).

O'Connell, E. C. (1991). An investigation of the relationship of psychological type to the completion of the Doctor of Philosophy Degree (Doctoral dissertation, Loyola University Chicago, 1991). Dissertation Abstracts International, 52(02A).

Ott, M. D., Markewich, T. S., & Ochsner, N. L. (1984). Logit analysis of graduate student retention. Research in Higher Education, 21(4), 439-460.

Patterson-Stewart, K. E. (1995). African American persistence through doctoral programs at predominantly white universities (Doctoral dissertation, University of Toledo, 1995). Dissertation Abstracts International, 56(09A).

Peacock, S. Y. (1996). The timely completion of the dissertation among graduates of five Ph. D. programs at Saint Louis University: The relationships among psychological type, life experiences, support group participation, and perceptions of advisor/advisee relationships. Dissertation Abstracts International, 56(09A).

Pogrow, S. (1978, Winter). Program characteristics and the use of student data to predict attrition from doctoral programs. College Student Journal, 12(4), 348-53.

Porozny, G H. J. (1970). Relationship of selected intellectual and personal factors to completion of business education doctoral program (Doctoral dissertation, University of North Dakota, 1970). Dissertation Abstracts International, 13(12A).

Presley, C. L. (1996). Individual and institutional factors that affect the success of African-American graduate and professional school students (Doctoral dissertation, University of Michigan, 1995). Dissertation Abstracts International, 56(08A).

Pristo, L. J. (1977). The prediction of doctoral program success for the adult education department at Arizona State University (Doctoral dissertation, Arizona State University, 1977). Dissertation Abstracts International, 38(2006A).

Quinn, E. L. C. (1991). Doctoral student retention and selected personal factors (Doctoral dissertation, University of Southern Mississippi, 1991). Dissertation Abstracts International, 52(09A).

Rawls, J. R., Rawls, D. J., & Harrison, C. W. (1969). An investigation of success predictors in a graduate school of psychology. Journal of Psychology, 72, 125-129.

Reamer, S. B. (1990). Persistence of adult learners in an external degree program (Doctoral dissertation, The Fielding Institute, 1990). Dissertation Abstracts International, 51(04A).

Reeble, B. E. (1975). Persistence and attrition of doctoral candidates in education at the University of Missouri-Columbia. Dissertation Abstracts International, 37(04A).

Reiff, M. (1992). Adults in graduate school: A qualitative study of how experience differs for persisting and non-persisting students (adult students). (Doctoral dissertation, University of California, Santa Barbara, 1992). Dissertation Abstracts International, 53(09A).

Respress, W. (1997). Perceptions of African-American males regarding factors supporting doctoral completion in colleges of education (Doctoral dissertation, East Tennessee State University, 1997). Dissertation Abstracts International, 58(03A).

Ritchie, M. (1996). African American persistence through doctoral programs at predominantly-white universities (Doctoral dissertation, University of Toledo, 1996). Dissertation Abstracts International, 56(09A).

Rocha-Singh, I. A. (1990). Doctoral students' perceptions of stress and social support: Implications for the retention of targeted students of color (Doctoral dissertation, University of California, Santa Barbara, 1990). Dissertation Abstracts International, 52(09).

Rosenhaupt, H. (1958). Graduate students: Experience at Columbia University, 1940-1956. New York: Columbia University Press.

Rosenthal, R. (1984). Meta-analytic procedures for social research. Beverly Hills, CA: Sage.

Sales, E. (1975). The doctoral student experience: A preliminary study. Journal of Education for Social Work, 11(02), 102-108.

Sauer, J. L (1986). Role, responsibility, and success in graduate school (Doctoral dissertation, University of California, Los Angeles, 1986). Dissertation Abstracts International, 47(102A).

Schmersahl, K. W. (1974). Doctoral admission criteria in the Department of Education at Louisiana State University as they related to student success and to criteria at comparable institutions (Doctoral dissertation, Louisiana State University and Agricultural and Mechanical College, 1974). Dissertation Abstracts International, 36(01A).

Schultz, M. C. (1983). "ABD" doctoral students from off-campus centers of the University of Southern California. Dissertation Abstracts International, 44(02A).

Skudlarek, L. J. (1992). An examination of selected variables associated with completion of requirements for a doctorate in education (Doctoral dissertation, University of Texas at Austin, 1992). Dissertation Abstracts International, 53(05A).

Stricker, L. J. (1994). Institutional factors in time to the doctorate. Research in Higher Education, 35(5), 569-587.

Swoboda, M. J. (1978). Factors impeding the completion of the Ph.D. degree among Ph.D. candidates: Focus on sex-related differences (Doctoral dissertation, University of Wisconsin, Madison, 1978). Dissertation Abstracts International, 40(03A).

Thacker, A., & Williams, R. (1974). Relationship of the GRE to GPA and success in graduate school. Educational and Psychological Measurement, 34(Winter), 939-944.

Thomas, G., Clewel, B., & Pearson, W. (1991). Role and activities of graduate schools in recruiting, enrolling, and retaining U. S. Black and Hispanic students. Draft report of minority graduate education. Project jointly sponsored by GRE and ETS, Princeton, N. J.

Tierce, G. L. (1984). Study of attrition factors in the doctoral programs in Educational Administration (Doctoral dissertation, University of Southern Mississippi, 1984). Dissertation Abstracts International, 46(01A).

Tinto, V. (1987/1993). Leaving college: Rethinking the causes and cures of student attrition (2nd Ed.). Chicago: The University of Chicago Press.

Traw, L. S. (1973). Predictive validity of selective criteria used in the doctoral program of the College of Education at the University of Wyoming (Doctoral dissertation, University of Wyoming, 1972). Dissertation Abstracts International, 33(3741A).

Tucker, A., Gottlieb, D., & Pease, J. (1964). Factors related to attrition among doctoral students. Cooperative Research Project No. 1146: U. S. Office of Education, Publication No. 8. East Lansing, MI: Michigan State University.

Tuckman, S., Coyle, S., & Bae, Y. (1990). On time to the doctorate. Washington D. C.: National Academy Press.

Tuckman, S., Coyle, S., & Bae, Y. (1989). The lengthening of time to completion of the doctorate degree. Research in Higher Education, 30(5), 503-515.

Vacc, N. N., & Picot, R. (1984). Predicting success in doctoral study. College Student Journal, 18(2), 113-116.

Valentine, N. L. (1987, May). Factors related to attrition from Doctor of Education programs. Paper presented at the Annual Forum of the Association of Institutional Research, Kansas City, MO. (ERIC Document Reproduction Service No. ED 293447).

Valentine, N. L. (1986). Factors related to attrition from doctor of education programs in the College of Human Resources and Education at West Virginia University (Doctoral dissertation, West Virginia University, 1986). Dissertation Abstracts International, 47(06A).

Wagner, D. V. (1986). Selected personality characteristics and situational factors as correlates of completion and non-completion of the doctoral dissertation (Doctoral dissertation, The University of Michigan, 1986). Dissertation Abstracts International, 47(09A).

Weiss, L. (1987). The relationship between personality variables and the completion of a doctoral dissertation. California School of Professional Psychology (Doctoral dissertation, California School of Professional Psychology, 1987). Dissertation Abstracts International, 48(09B).

Wentzel, M. L. (1987). The relationship of locus-of-control orientation to the academic achievement of doctoral students (Doctoral dissertation, University of Northern Texas, 1987). Dissertation Abstracts International, 48(03A).

Whitacre, M. D. (1987). A follow-up study of the inactive doctoral students in the Department of Educational Administration at the University of Akron, Ohio (Doctoral dissertation, University of Akron, 1987). Dissertation Abstracts International, 47(11A).

White, L. L. (1986). A descriptive analysis of student attrition in the Florida State University and the University of Western Florida Cooperative Doctoral External Degree Program (Doctoral dissertation, The Florida State University, 1986). Dissertation Abstracts International, 47(02A).

Williams, J., Harlow, S., & Gab, D. (1970, December). Longitudinal study examining prediction of doctoral success: GPA as criterion, or graduate vs. non-graduate as criterion. Journal of Educational Research, 64, 161-164.

Williamson, M. & Fenske, R. (1992, April). Mentoring factors in doctoral programs of Mexican American and American Indian students. Paper presented at the anual meeting of the American Educational Research Association (AERA), San Francisco. (ERIC Document Reproduction Service No. ED 352220).

Williamson, M. J. (1991). Mexican American and American Indian student satisfaction with their doctoral programs (Doctoral dissertation, Arizona State University, 1991). Dissertation Abstracts International , 52(04A).

Willingham, W. W. (1974). Predicting success in graduate education. Science, 183, 273-278.

Wood, D. J. (1978). Internal and external indicators of attrition in the College of Education doctoral program at the University of Toledo (Doctoral dissertation, University of Toledo, 1978). Dissertation Abstracts International, 39(06A).

Wright, C. R. (1964, Fall). Success or failure in earning graduate degrees. Sociology of Education, 38, 73-97.

Zwick, R. (1991). Differences in graduate school attainment patterns across academic programs and demographic groups. A Research Report of the Minority Graduate Education Project. Princeton, NJ: Educational Testing Service. (ERIC Document Reproduction Service No. ED 354852).